

## PATENT CLAIMS

1. A high pressure feed pump comprising  
a high pressure cylinder having a central bore,  
5 a delivery piston mounted for reciprocation within  
the central bore of the cylinder,

a drive shaft for driving the delivery piston and  
which includes an eccentric journal formed thereon, and  
a rolling ring rotatably mounted about said eccentric  
10 journal, and with said rolling ring having a cambered  
circumferential surface, and

a plate-like spring element positioned between a  
front end of the delivery piston and the rolling ring so  
that the spring element rests firstly on the  
15 circumferential surface of the rolling ring via a contact  
surface, and secondly on the front end of the delivery  
piston via an annular surface.

2. The high pressure feed pump of Claim 1 wherein  
20 the front end of the delivery piston is of concave  
configuration.

3. The high pressure feed pump of Claim 1 wherein  
the side of the spring element which faces the delivery  
25 piston is of concave configuration.

4. The high pressure feed pump of Claim 1 wherein  
the front end of the delivery piston includes a radial  
extension.

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5. The high pressure feed pump of Claim 4 wherein  
the extension comprises an adapter which is moveably  
mounted to the remainder of the piston.

6. The high pressure feed pump of Claim 1 wherein the spring element is formed by the base of a bucket shaped tappet, with the bucket shaped tappet having a circumferential wall which is mounted so as to be guided for movement in the direction of movement of the delivery piston.

7. The high pressure feed pump of Claim 1 wherein one of (1) the front end of the delivery piston and (2) the side of the spring element which faces the delivery piston, is of concave configuration, and wherein at maximum pressure loading, the region of the spring element which lies opposite said contact surface lies substantially flat against the front end of the delivery piston.

8. A high pressure feed pump comprising a main housing mounting a drive shaft for rotation about a rotational axis, with said main housing including a chamber which extends radially from said rotational axis,

a high pressure cylinder mounted to said main housing, with the high pressure cylinder defining a central bore which is aligned with said radially extending chamber of said main housing and which is perpendicular to said rotational axis,

a delivery piston mounted for reciprocation within said bore of said cylinder and defining a front end which faces toward said drive shaft,

an eccentric journal formed on said drive shaft at a location aligned with the front end of said delivery piston,

a spring biasing member for biasing the delivery piston in a direction toward said drive shaft,

a plate-like spring element positioned between the front end of the delivery piston and the eccentric journal so that the spring element rests firstly on the eccentric journal and secondly on the front end of the delivery piston, and such that upon rotation of the drive shaft about said rotational axis the delivery piston is reciprocated in the bore of said high pressure cylinder, and

said spring element being formed by the base of a bucket shaped tappet, with the bucket shaped tappet having an outer wall which is mounted within the chamber of the main housing for movement in a direction parallel to the reciprocating movement of the delivery piston.

9. The high pressure feed pump of Claim 8 wherein one of (1) the front end of the delivery piston and (2) the side of the spring element which faces the delivery piston, is of concave configuration, and such that upon maximum loading the spring element is deformed into the concave configuration.

10. The high pressure pump of Claim 9 further comprising a valve housing which includes a delivery chamber which communicates with the end of the delivery piston opposite said front end, and an inlet valve and an outlet valve both communicating with the delivery chamber.

11. The high pressure pump of Claim 10 wherein the drive shaft further comprises a rolling ring rotatably mounted about said eccentric journal and with said rolling ring having a cambered circumferential surface.